

**IMPROVING COMMUNICATION ABILITY AND LEARNING  
ACHIEVEMENT IN BIOLOGY LEARNING STRATEGY  
WITH USING JIGSAW**

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**Abstract**

Learning Strategies is one of the subjects Biology expertise for students of International Standard Teacher Education (ISTE) program. Learning strategies biology course that have been done have not been satisfied in the aspects of communication skills and learning achievement. Observations during the learning process informed that the presence of difficulties in communication either in the form of asking, expressing opinions, answering questions, and explaining. In fact, communication is a fundamental skill in implementing the learning. One attempt that can be done to improve communication skills and learning outcomes is to implement a model of Cooperative Learning Jigsaw. This study aims to improve communication skills, improve learning outcomes, and indirectly practice English usage, teaching skills, skills in preparing lesson plans, and developing and using instructional media. This type of research is classroom action research which is conducted in two cycles. This research instrument in the form of sheets of observations, achievement test, and record the activity of communication. Student's ability in communicating was analyzed using a percentage formula. The results showed that the ability to communicate with students in Cycle I (mean = 81.25%) and Cycle II (mean = 87.50%). Average of student learning achievement Cycle I and Cycle II 61.94% 78.94 subsequently. It can be concluded that the application of the Jigsaw cooperative learning model could improve communication skills and student learning achievements.

**Key words:** Communication Ability, Student's Learning achievement

**INTRODUCTION**

Learning is a process of one's effort to obtain a change in behavior as a result of his own experience in the interaction with the environment. Learning process is a unity of two processes between the student and lecturer. The first is the student's learning activity, and the second process is lecturer's teaching activity. Both of them support each other to achieve the optimal learning outcomes (Rusmatan, dkk., 2003). The harmonic cooperation between lecturer and student in learning process will provide the optimal learning outcomes (Martono, 2005). According to Munandar (2003), the challenges for the lecturers in teaching are how they can explain the lecture materials well, deliver the essential materials attractively, confident, and improve their students' motivation.

Biology learning strategy is one of the skill subjects especially for biology education either regular or International Standard Teacher Education (ISTE) program. Learning process in this subject has three achievement aspects such as comprehensions of knowledge substance, skill application, and students' ability to communicate in English.

The essential of learning process are communication and multiple interactions between student and teacher. Communication (conceptually) is inform (and spread) news, knowledge, thoughts, and values to increase students' participations. So, the matters that have been informed belong to us (Sardiman, 2001: 8).

To achieve an optimal learning, fitting skilled teachers to interact and communicate with students. Communication skills become an important requirement in the teacher - student interaction for the formation of students' knowledge and understanding of the material is influenced by the quality of communication both verbal and non-verbal. There are three patterns of communication between teachers and students in the process of educational interaction, as an act of communication, interaction and communication as communication as a transaction (Bahri, 1997: 12).

Some impact if the teachers are not able to communicate well is 1) not every bit of information learning materials can be delivered well, 2) students cannot learn properly because do not understand teacher instruction, 3) no one understands the message from teacher, 4) the interaction between teachers and students is limited.

Biology lecture learning strategies that have been done in learning 2009/2010 has not been satisfied in the aspects of communication skills. During observations the study inform the presence of obstacles in communication either in the form of asking, express opinions, answer questions, and provide an explanation. In addition, the results of interviews with some of the students registered at ISTE program, informs the persistence of obstacles to understand such a complex matter.

One effort that can be done to improve communication skills and learning to speak English is to apply the Jigsaw cooperative learning models. Jigsaw cooperative learning model consists of a syntax that is expert group discussions, group discussions origin, quizzes and awards (Lufri, 2008). Cooperative learning is a teaching model in which students learn in small groups that have different levels of ability. In completing the group task, each member of mutual cooperation and help to understand the learning materials. Slavin (1994: 287) states that cooperative learning is a good foundation for improving student achievement motivation. This model has three characteristics, namely: (a) students working in small teams (b) students are encouraged to help one another learn academic material nature or in the group task and (c) the students were given rewards or prizes on the basis of group achievement.

Johnson, Johnson, & Smith (1991) in Shambaugh (2006: 153) suggest cooperative learning has five characteristics, namely: Interdependence, One-to-one interaction, individual accountability, social skills, group processing. To further develop the competence of cognitive, affective, and psychomotor of ISTE's students, made some modifications. The first modification of the task of providing is the early learning reading and answering questions. The second modification is to give a chance discussion classically performed through a particular sub-topic presentation by non- expert participants.

Jigsaw cooperative learning syntax in directing students was done to explore communication skills and mastery of the material. The group of experts should be able to communicate appropriately and correctly to get a conclusion that will be distributed to group members in a original group. Each member of the group must communicate appropriately in order to achieve the purpose of the group as a whole. Mastery of the material to support improved learning outcomes facilitated by reading assignments and answer questions. This initial capability will be strengthened and developed through discussion. Affirmation of the concept will be carried through in the classical presentation.

The third modification was done specifically related to the planned material students need hands-on as one proof of understanding of the material. Simulation is a teaching practice that is set in a short time, and it was conditioned resemble real learning. The third modification in the Jigsaw cooperative learning is done in lieu of a class presentation (second modification). Starting from the problem, the root of the problem and the proposed solution of the problems outlined above, it can be formulated research problem "Does the application of learning models Jigsaw Modifications to improve communication skills and learning achievement of students participating in the program ISTE learning strategies Biology course?"

## **RESEARCH METHOD**

Type of research is classroom action research. This research is directed to improving the learning process Biology Learning Strategies course, so it is more centered on the student. The main target is to improve teaching skills in the English language are fostered through an introductory lecture to the English language. This research was conducted in two cycles. Each cycle consists of four steps, namely research plan of action, implementing the action, observing the action and reflect the action.

a. Planning stage, activities undertaken are:

- 1) prepare the subject of discussion
- 2) develop unit lecture program for each meeting.
- 3) prepare the topics and subtopics that will be discussed and adjust the number of group members and group number.
- 4) instruct each student to read the task as the provision of early learning task
- 5) prepare forms of observation to observe the behavior of students in learning.

b. Action Stage

At this stage the activities carried out are: implementing learning by using the Jigsaw model in accordance with the unit lectures planned event.

c. Stage of observation

observations of student communication capabilities include: ask lecture or friends, expressing an opinion, explain, answer questions lecturers or friends. Observations were carried out using the observation sheet 4 times (according to the number of meetings)

d. Reflection Stage

Based on the observations and the results of discussions between the research team on the observation sheet and test results at the end of the cycle, then the decision is taken to learning based on the criteria of success achieved in each cycle. The criteria considered are:

- Students demonstrate the ability to communicate in English with an average frequency percentage reaches 85%.
- Students demonstrate mastery and understanding of the material through the mastery of the value of the average rate reached 75%.

Subject of research were students majoring in Biological Science Program UNP ISTE Learning Strategy is taking Biology courses from January to June 2010. The instrument in this study is in the form of sheets of observations and test results to learn.

The observation of the student's ability to communicate analyzed using percentage formula. Students' understanding of the material is evaluated through test results to learn. Percentage obtained from the grouping is done according to the following criteria:

90-100% = Excellent

80-89% = good

65-79% = Pretty Good

55-64% = Not good

0-54% = Very bad

(Modified from Purwanto, 2004).

## RESULT AND DISCUSSION

### Result

The data obtained in this study is the ability of communication and student learning outcomes. Data communication skills acquired during the learning process through observation sheets and learning competencies acquired through a written test at the end of the cycle of research activities. The results of the study will be presented in this section. The participants average scores on each aspect can be seen in Table 1 and 2.

**Table 1.** Description of data communication ability of students

Cycle	Percentage communication ability	Category
I	81,25	Good
II	87,50	Good

Based on the result of this research (Table 1) showed the improvement of students' communication ability in general. In the first cycle, the average of 81.25 students' communication ability with good categories and second cycle increased to 87.50 in good categories. Based on these data indicate that Jigsaw cooperative learning model improved the communication skills of students during the learning process learning strategies biology. Communication skills are explored, among others, asked, expressing an opinion, explain the material, answer the question. All of these activities are part of the basic skills that teachers must be held by prospective teachers. With these activities students will be used to communicate well with faculty or with colleagues who will ultimately be applied to the world of work. In accordance with Lufri's opinion (2007), the absolute basic skills were possessed by teachers. Through the application of the basic skills of teachers is expected to optimize achievement.

**Table 2.** Average Achievement in the first cycle and second cycle

Cycle	Average	Number of Students who were Completed	Number of Students who were not completed
I	61,94	12,5	87,5
II	78,94	62,5	37,7

Table 2 showed the results of student learning, the average achievement in the first cycle has not met the passing standard. The average value of 61.94 student achievement by the number of students who graduated is 12.5% and 85.5% has not obtained the desired results. In the second cycle there is an improvement, the average student results has reached 78.94. Although the students who achieve the minimum passing standard has not reached 100% but the average student results have been increased. Achievement of learning outcomes is closely related to communication activities undertaken by the students.

## **Discussion**

Scientific fields of Biology Learning Strategy serves as a prerequisite material that must be mastered by the student education program. Through the mastery of a number of topics that have been compiled in the syllabus and lesson plans, the students as prospective teachers have to be believed to have start-up capital as an educator.

Scientific studies teaching strategy includes theoretical as well practical application. As a theoretical study, then all topics that have been arranged to be controlled very well by the students. To that end, any effort in order to equip the base material for student teachers to be implemented measurable. Classroom action research that has been done is one way to help ensure mastery of the material by learners

In studies that have been conducted, researchers using the Jigsaw cooperative learning model. Jigsaw cooperative learning is one of the learning models that is able to develop cognitive competency in addition to the social skills of the learners. This is caused by the presence of a number of recurring syntax that guides that students learn well. Each student has the same responsibility to achieve the predetermined competencies.

At the beginning of the core activities, students are introduced with a double identity, as a member of the original group and members of the expert group. At the time of granting the identity, enthusiastic students want to know the duties and learning mechanisms. Curiosity is one of the driving factors for the following study carefully. During the Jigsaw learning, students have the opportunity to know the material through reading assignments, group discussions in origin, the expert group discussion, presentation materials, class discussion, and evaluation (quiz) on each learning activity. The task of directing the student has read the initial provision to understand the material. Initial understanding is extremely important in the process of assimilating information.

Furthermore, students gathered in groups to instill a sense of origin and the need to work together to achieve one goal, which is to understand the topic of the lecture that day. Students were given the emphasis of duties and responsibilities in order to succeed personally and get an award. At this stage, characteristic of cooperative learning objectives which include structure, task structure, and award the foundation students in group activities. Students follow directions seriously considering the duties and responsibilities carried accountable will return again in their group setelah dig in expert groups.

The ability to communicate began explored when students discussion in the expert group. At this stage, the observed ability of the students to share their initial information through the previous reading. Furthermore, the opinion concludes that a concept will be informed to the members in the group home. In addition to expressing their opinions and explain the activity, another activity observed is asked, answer the question. In the first cycle of the activity is still low, so that remedial action is done for the next cycle.

In the second cycle communication skills students are equipped with the ability to interact during the simulation as a model teacher. This activity aims to train students to be able to explain the learning materials. Communication students through ask, answer, explain, argue during the second cycle to be more frequent than in cycle I. So that student achievement also be increased to 78.9 %. This is due to the pre-college preparatory students have prepared a very mature with far more time than in cycle I. In the first cycle, the preparation of students read only a duty, and a time of discussion in expert groups as the most important stage of information is only available to dig 20 minutes. In the second cycle, the time available for the expert group discussions because they do a lot more out of learning so that more freely. In addition, the task of reading is also accompanied by the preparation of the learning plan that will be displayed directly in the simulation in the classroom. Thus, mastery of the material is also more mature.

Learning activities in the second cycle looks more attractive because each representative group featuring lesson plans that have been designed by a group of experts. Simulations are also able to lure more students the ability to communicate, especially expression. At this stage, the lecturer invited all the students to comment and analyze the simulation exactly right or not in accordance with the actual theory. So the students are able to analyze simultaneously assess and clarify information. Through these simulations, students are also able to assess the management of learning by their teachers in the past, so they've been able to have principles about what is right, proper, decent or otherwise related to the role of the teacher. Obtaining this kind of information has little contextual elements (associated with real experience).

Psychologically Jigsaw cooperative learning model provides a huge benefit to the students, among others: (1) motivate students to study hard because of peer pressure and the group will realize on going assessment, (2) eliminate the fear of the child to express opinion and answer questions, and (3) foster students' ability of cooperation, critical thinking and the ability to help a friend. This is in accordance with the opinion of the Khoirul in Supriyadi (2003) suggested some type of special-purpose learning models include assessing dependence Jigsaw positive in conveying and receiving information between the group members to encourage mature thinking and provide practice opportunities to talk (and listen) to practice in conveying information .

## CONCLUSION AND SUGGESTION

### Conclusion

The result of this research showed that the implication of cooperative learning technique type jigsaw could improve the abilities of students in general, such as communication skill, achievement, English practice, teaching skill, practice skill in preparing lesson plans, and instructional media development. The results showed that the communication ability students in Cycle I (average = 81.25%) and Cycle II (average = 87.50%). The average of students' achievement in the Cycle I are 61.94% and increase of Cycle II 78.94%. So, it can be concluded that the application of the Jigsaw cooperative learning model could improve communication skills and student learning achievements. The result of this research showed that the implication of cooperative learning technique type jigsaw could improve the abilities of students in general, such as communication skill, learning outcome, English practice, teaching skill, practice skill in preparing lesson plans, and instructional media development.

### Suggestion

Based on the above conclusions, the researchers suggest the following: (1) to the faculty are expected to know, understand and implement cooperative learning model Jigsaw and modifications in order to improve student learning outcomes in the course of learning strategies biology student ISTE. (2) for researchers The next want to apply the Jigsaw cooperative learning model is able to manage the allocation extent possible time, and support facilities including instructional media.

## REFERENCES

- Abhimanyu, S., Pah, D.N. (1985). *Asking Basic and Advanced Skills: Micro Teaching Guide*. Ministry of Education and Culture Directorate General of Higher Education. London: Institute of Education Development Project Workforce Education. .
- Arismunandar W. (2003). *Communication in Education*. Papers Presented at the Appreciation and Service Professor and Senior Lecturer, Department of Mechanical Engineering, ITB East Hall, 27 September 2003
- Djamarah, SB. (2000). *Teachers and Learners in Educational Interaction*. Jakarta: Rineka



Reserved.

- Djamarah and Zain. (2002). *Teaching and Learning Strategies*. Jakarta: Rineka Reserved.
- Ibrahim, M. (2000). *Cooperative Learning*. New York: Graduate Program
- Haryanto. (2000). *Scientific Writing*. Editor. Writing and Presenting Scientific Method. Textbook for students. Jakarta: ECG.
- Ilyas A. (1998). *Creative Learning Student Characteristics: Descriptive Analytical Study of Students Against Creative and Implications for Development Program Municipal High School Student Creativity Padang*. Abstract Thesis Guidance and Counseling Program Graduate Studies Year 1998.
- Lufri. (2006). *Biological Learning Strategies: Theory, Practice and Research*. Champaign: Department of Biological Science UNP
- Martono, K. (2005). *Role in Teaching and Learning Books* GE Mosaic, June 2005.
- Mudhoffir. (1986). *Principles of Learning Resources Management*. Jakarta: PT. Teens Rosdakarya.
- Muller, Justine Brandi. (2005). *Retelling Stories*. (<http://www.colorincolorado.org/article/13282>, diakses 14 April 2010).
- Nasution, S. (1995). *Didactic Principles of Teaching*. London: Earth Literacy.
- Oemar, Hamalik. (2004). *Lecturer Education Competency Based Approach*. London: Earth Literacy.
- Padmo, D. (2003). *Learning Media*. Module X. Deed Book 8820 Topic. Jakarta: Central Publishing Open University.
- Purwanto, Ngalim. (2001). *Principles and Techniques of Teaching Evaluation*. Youth Rosdakarya.
- Rohani, Ahmad. (1997). *Instructional Educational Media*. Jakarta: Rineka Reserved.
- Rooijackers Ad. (1988). *Mengajar Dengan Sukses: Petunjuk untuk Merencanakan dan Menyampaikan Pengajaran*. Jakarta: Gramedia
- Rustaman, NY, Dirdjoseomarto, S., Yudianto, SA, Ahmad, Y., Subekti, R., Rochintaniawat, D., Nurjhani, M. (2003). *Biology Teaching and Learning Strategies*. Common Text book (edisi revisi). Technical Cooperation Project for Development of Science and Mathematics Teaching for Primary and secondary Education in Indonesia (IMSTEP). Bandung: Universitas Pendidikan Indonesia.
- Sardiman. (2003). *Interaction and Learning Motivation*. Jakarta: PT. King Gravindo Persada
- Shambaugh, Neal & Magliaro, Susan G. (2006). *A Instructional design ; A System Approach for Reflective Parctice*. United States of America : Pearson Education, Inc.
- Slavin, R.E. 1994. *Educational Psycology; Teory and Practice*. Fourth Edition, Jhons Hopkins University.
- The Shah, M. (2003). *Psychology of Learning*. Jakarta: King Gravindo Persada.
- Zaini et al. (2002). *Learning Design in College*. New York: Center for Teaching Staff Development (CTSD) IAIN Sunan Kalidjaga.

